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# AN APPRAISAL OF THE BOMBING OF NORTH VIETNAM



(THROUGH 11 OCTOBER 1966)

OCTOBER 1966

Prepared Jointly by  
The Central Intelligence Agency  
and  
The Defense Intelligence Agency



DIA review(s) completed.

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AN APPRAISAL OF THE BOMBING OF NORTH VIETNAM  
THROUGH 11 OCTOBER 1966

SUMMARY

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1. [ ] Air strikes against North Vietnam in September and early October continued at a high level with particular emphasis on lines of communication (LOC's), dispersed POL storage sites, and transportation equipment. The campaign against North Vietnamese POL continues to chip away at the country's bulk and dispersed storage capacity, making it more difficult to import and distribute POL. The North Vietnamese, however, have expended great efforts in dispersing and concealing the remaining POL stocks thus making these sites more difficult and costly targets for US forces. There is no evidence yet of a shortage of POL in North Vietnam.
  2. [ ] Although air strikes against transport facilities and equipment continued at a high level during September, the overall capability of the transport system to move supplies to and within North Vietnam apparently improved. Expansion of the rail and road networks is continuing, and use of watercraft on both the inland and coastal waterways has been at a high level. Extensive damage and destruction to watercraft and trucks in Military Region IV, however, has undoubtedly hindered the movement of supplies in this area. Nevertheless, there has been a major logistical buildup in the area of the DMZ and there is no evidence of a serious shortage
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of supplies in Military Region IV. Communist truck movements over the Mu Gia Pass into Laos are reported to have begun earlier than normal this year and traffic is also moving into Laos via the route farther south (Route 137). Increased watercraft activity was noted on the feeder routes in the vicinity of Nape and Mu Gia Passes during September. In addition, significant coastal traffic in the Dong Hoi area was apparent during September, probably in support of the buildup in the DMZ area. It appears that more emphasis is being placed on the movement of supplies by water instead of movement by the heavily interdicted roads, particularly in the southern portions of the country.

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3. [ ] Three of the five major rail lines in the country are currently open for through service, including the two lines important for the movement of foreign trade. Shuttle service continues where necessary on the other lines. Sufficient time has elapsed to complete the standard gauge line from Kep to Thai Nguyen as well as the conversion to dual gauge of the Dong Dang line from Kep to the Chinese border.

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4. [ ] There is still no evidence that the air strikes have significantly weakened popular morale, and there is no known serious or widespread opposition to the regime.

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5. [ ] The economy continues to show signs of strain in the form of localized food shortages, lagging industrial growth,

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decreased agricultural production, reduced exports, and delays in the implementation of plans for industrial development as a result of the air strikes. The damage sustained by North Vietnam, however, is in large measure compensated by aid received from other Communist countries. The 1966 spring rice crop is estimated to be at least 200,000 metric tons below the average spring crop of the last five years, because of poor weather and the disruptive effects of the bombing on agricultural labor. The measurable damage to the economy caused by the air strikes now stands at more than \$140 million.

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Effects on Military Targets

25X1 1. [ ] The ROLLING THUNDER program during September and early October was marked by continued high sortie rates and generally favorable weather. Emphasis continues to be placed on attacking lines of communication (LOC's), dispersed POL storage sites, and transportation equipment. The campaign against North Vietnamese POL continues to chip away at the country's bulk and dispersed storage capacity. This effort has been effective in making it more difficult to import and distribute POL. The North Vietnamese have expended great effort, however, in dispersing and concealing remaining POL stocks thus making these sites more difficult and costly targets for US forces. Strikes were made during September against five major and over 160 dispersed POL storage sites. As of 11 October 1966, about 80 per cent of the JCS targeted POL storage capacity had been destroyed. Because of the dispersal program, it is not anticipated that serious reconstruction of major bulk POL facilities will be attempted in the near future.

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Rail

imports of POL into North Vietnam from China are estimated to be continuing, and imports of POL by other means have probably occurred. There is still no evidence of any adverse military or economic effects that can be attributed to attacks on POL facilities. It must therefore be assumed that POL stocks on hand and recent imports have been adequate to sustain operations. This condition will undoubtedly continue until the major flow of POL into the country is curtailed. In any event, high priority activities such as military transport, SAM support, and aircraft operations will be sustained at the expense, if necessary, of other POL consuming functions.

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3.  Although air strikes against transport facilities and equipment continued at a high level during September, the overall capability of the transport system to move supplies to and within North Vietnam apparently has improved. Expansion of the rail and road networks is continuing, and use of watercraft on both the inland and coastal waterways has been at a high level. The continuing high rate of destruction and damage to watercraft and trucks in Military Region IV, however, has undoubtedly hindered the movement of supplies in this area. Three of the five major rail lines in the country are currently open for through rail

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service, including the two lines important for the movement of foreign trade -- the Hanoi-Dong Dang and the Hanoi-Haiphong lines. Shuttle service continues on the other lines between and around interdicted points. The rail line from Hanoi to Haiphong was probably open during September to through traffic, and the Dong Dang line was open for at least half of the month. The Hanoi-Vinh and Hanoi-Lao Cai lines remain closed to through rail service, but the Lao Cai line may be open for a small amount of through traffic between Hanoi and the industrial cities of Lam Thao and Viet Tri. Sufficient time has elapsed to complete the remaining work on the standard gauge line from Kep to Thai Nguyen as well as the conversion to dual gauge of the Dong Dang line from Kep to the Chinese border. The completion of this work will provide an alternate rail route for the Hanoi-Dong Dang rail line in case of interdiction between Kep and the Hanoi area, and will permit the use of the standard gauge rolling stock between China and the iron and steel complex at Thai Nguyen. South of Hanoi, many bridges and some rail yards and sidings were attacked on the Hanoi to Vinh line with especially heavy damage reported to the rail facilities in the Ninh Binh, Thanh Hoa, and Phu Ly areas. The destruction at Phu Ly has disrupted rail service between Hanoi and the important industrial city of Nam Dinh.

4.  The program of road interdiction was concentrated



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in the North Vietnamese Panhandle during September and early October, with damage to the highway system above the 20th parallel at a low level. The main coastal route south of Thanh Hoa was heavily cratered from Ninh Binh to the DMZ forcing traffic to use the less direct bypass and secondary routes. Many destroyed bridges now have lower caliber alternate facilities ranging from seasonal fords to multiple ferries. It is entirely possible that air actions in the North Vietnamese Panhandle have slowed the intensive logistical buildup in the DMZ area. Nevertheless, the buildup in the DMZ apparently continues, and there is no evidence of any serious shortages of supplies in Military Region IV. Communist truck movements into Laos over the Mu Gia Pass began earlier than normal this year, according to roadwatch team reports. Clearing weather and improved roads in Laos have probably facilitated this early movement in the Mu Gia area. Traffic is also moving into Laos via the route further south (Route 137).

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5. [ ] Despite the large numbers of vehicles struck during September, North Vietnam has been able to offset vehicle losses by the continuing import of sizeable numbers of trucks from other Communist countries. Nevertheless, the continued destruction of trucks, coupled with heavy interdiction of the lines of communication, undoubtedly is resulting in at least local shortages of supplies and material. The chart at Tab A contains the results of strikes on North Vietnamese targets through 10 October 1966.

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6. ☐ Aerial operations during the period extended over 22 waterway routes with heavy emphasis placed on attacking craft on inland routes as opposed to those transiting coastal waters. Significant coastal watercraft activity was noted in the Dong Hoi area during September, probably in support of the DMZ buildup. Increased watercraft activity was also noted in the vicinity of the feeder routes in the Nape and Mu Gia Pass areas. The recent use of a Soviet ocean-going vessel to move coal from Cam Pha to Haiphong may indicate that power failures have seriously disrupted barge loadings at Hon Gay, that there is now a shortage of barges in northern waters, or that an effort is being made to reduce the exposure of North Vietnamese barges to air attack. In sum, it appears that more emphasis is being placed on the movement of supplies by water instead of movement by the heavily interdicted roads, particularly in the southern portions of the country.

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7. ☐ Despite the intensity of US air strikes, Hanoi retains the capability to continue support of activities in South Vietnam and Laos even at increased combat levels and force structures. Moreover, the armed forces of North Vietnam continue to expand and the infiltration of men and material into South Vietnam and Laos continues at a high rate. Nevertheless, it is estimated that the North Vietnamese capability for overt aggression has been limited by US air actions.

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Leadership and Public Reactions

8. [ ] The North Vietnamese leadership in the past several weeks has reasserted its determination to press on with the war in spite of the US bombing raids on the DRV. Official DRV propaganda statements during the same period have been equally rigid in condemning recent proposals for negotiations offered by the US, British and foreign statesmen at the UN. North Vietnam continues to insist that the basis for any settlement of the war must rest upon its terms.

9. [ ] From the point of view of general popular morale, there continues to be no hard evidence that the willingness of the population to bear the burdens of increasing air strikes has been adversely affected to the extent that it might influence the regime's war policy. The best evidence suggests that, despite the hardships and shortages encountered by the general population, there is still no serious or widespread opposition to the government.

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Effects on the Economy

10. [ ] The economy of North Vietnam continues to show signs of strain in the form of localized food shortages, lagging industrial growth, decreased agricultural production, reduced exports, and delays in the implementation of plans for industrial development. However, the transportation and petroleum distribution systems, the two major military/economic targets of the air strikes, apparently continue to function at levels adequate to meet the essential economic and current military requirements of the country.

11. [ ] Communist aid to North Vietnam continues to be the vital element in maintaining essential production and services and in enabling Hanoi to defend the North and support the war in the South. On 3 October, the USSR announced the conclusion of a broad new aid agreement with North Vietnam which almost certainly includes military supplies as well as economic assistance. The agreement followed repeated Soviet assurances that economic and military aid would continue on an "ever increasing" scale. Both outright grants and additional credits are included in the Soviet pact. Just prior to this agreement, North Vietnam signed new agreements with China, North Korea, Bulgaria, Czechoslovakia, Hungary, and Rumania. These agreements also are believed to have provided for outright aid grants. The bulk of imports of civilian

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goods as well as of military supplies must now be paid for by Communist aid since Hanoi's ability to export has deteriorated in the last 18 months as a consequence of the air strikes. Exports of coal, the principal earner of foreign exchange, were lower than those recorded in any of the 18 previous months; and no seaborne exports of cement and apatite were noted.

25X1 12. [ ] The 1966 spring rice crop -- which normally accounts for about one-third of the annual harvest -- is estimated to be at least 200,000 metric tons below the average spring crop of the last five years (1.7 million metric tons). This shortfall, which would be valued at about \$17 million, is the result of poor weather and the disruptive effects of the bombing on the use of agricultural labor. Imports, however, apparently have enabled the rice ration to remain basically the same as in the past year. Although there are no signs that the food situation is critical, reports of shortages of milk, flour, vegetables, and other foods in urban areas persist. These shortages are largely a result of delays in distribution caused by the bombing of the transportation system.

25X1 13. [ ] The urban population has had to endure the disruptions to daily life caused by evacuation, dispersal of business and industry, changes in working schedules, and other civil defense measures. The continued emphasis in the Hanoi press on improved management of evacuation procedures suggests that the

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program in the large urban areas is moving slowly. There are indications, moreover, that many urban inhabitants leave during daylight hours but return at night to find housing and services.

14. [ ] The shift in North Vietnamese economic priorities from long-term development to maintenance of economic stability is indicated by the apparent suspension, or at least drastic curtailment, of construction of the Thac Ba hydroelectric power plant, the largest under construction in North Vietnam. [ ]

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[ ] indicates that the plant is some two years away from completion. The most likely explanation for the abandonment or delay of this project is a more immediate need elsewhere for labor and construction materials. The demands of the war had earlier caused the leadership to scrap a five-year plan for economic development in 1966-70 in favor of a less ambitious two-year plan.

15. [ ] There is as yet no evidence that the loss of petroleum or petroleum facilities as a result of the bombing has had a measurable effect on the economy of North Vietnam. Despite the lack of any single oil storage facility with sufficient capacity to accept the cargo of a fully-loaded ocean tanker, the North Vietnamese were able to discharge two Soviet tankers, each carrying almost 11,000 tons of petroleum products, in about 20 and 15 days,

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respectively. If North Vietnam can continue this rate of acceptance, it can satisfy its requirements for POL without resorting to alternative means of supply. Inasmuch as no bulk POL cargoes for North Vietnam have been diverted to China since August, this particular expedient may now be unnecessary. Moreover, there are indications that the USSR plans to supply POL to North Vietnam from the Soviet Far East using small tankers.

25X1 16. [ ] Reports of continuing discovery of dispersed storage tanks sites -- particularly on navigable waterways -- suggest that North Vietnam probably is well prepared to store and distribute its POL supply. [ ]

reveals that several damaged storage tanks which were still standing after the bombings were being dismantled. This is probably part of a salvage operation, and the dismantled tanks may be reconstructed at another site.

25X1 17. [ ] Direct losses caused by air strikes against economic and military facilities and equipment measured in terms of estimated reconstruction or replacement cost are now estimated at some \$126 million as shown in the tabulation below.

<u>Economic Facilities and Equipment</u>		<u>Military Facilities and Equipment</u>	
<u>Targets</u>	<u>Million Dollars</u>	<u>Targets</u>	<u>Million Dollars</u>
Railroad/Highway Bridges <u>1/</u>		Barracks	16.5
Reconstruction	16.2	Ammunition Storage	4.5
Temporary Repairs	3.6 <u>2/</u>	Supply Depots	3.2
Transportation Equipment	30.5 <u>3/</u>	Radar and Communications	1.2
Railroad Yards and Ports	1.0	Naval Bases	0.8
Electric Power Plants	11.5	SAM Sites	2.0
Petroleum Storage Facilities	2.3 <u>4/</u>	Aircraft	17.8 <u>5/</u>
Manufacturing Facilities	2.1	Airfields	0.4
Telecommunications Facilities	0.2	Naval Craft	10.8
		Miscellaneous Targets of Armed Reconnaissance	1.2
Total	<u>67.4</u>	Total	<u>58.4</u>

- 1/ The estimate in this category is incomplete because of inadequate post-strike photography.
- 2/ Includes \$2.4 million expended to date on temporary repairs and \$1.2 million required to provide temporary repairs for structures damaged but not yet restored to operable condition.
- 3/ Excludes destruction and damage to trucks in Laos. The estimated value of damage and destruction to transportation equipment in North Vietnam is based on pilot reports and may be somewhat overstated.
- 4/ Excludes destruction and damage to support facilities and contents of petroleum tanks.
- 5/ Includes five MIG-17's destroyed in 1965 but previously omitted from this report.



Measurable indirect losses include losses of foreign exchange earnings of \$14.1 million, losses in the 1965 fall rice crop of \$3.5 million, and an unknown part of the losses of at least \$17 million in the 1966 spring crop. In addition, there are many other losses and costs to the economy and the military establishment which cannot be assigned values. These include the loss of production and lower productivity of labor resulting from the dispersal of industry, time lost from work as a consequence of civil defense measures, and loss of production caused by shortages of electric power.

RESULTS OF STRIKES ON NVN TARGETS a/ THRU 10 OCTOBER 1966

Fixed Targets	Total Targets			Targets Struck		No. Attacks	Strike Sorties <u>b/</u>	% of National Capacity	
	<u>c/</u> No.	<u>d/</u> No(*)	<u>d/</u> %	No(*)	<u>d/</u> %			Destroyed	<u>g/</u> Inactive
Barracks	443 Men	62	39.63	45	33	217	2348	22.70	5.56
Ammo Depots	112.6 MT	18	96.7	13	75.7	52	1155	73.4	37.51
POL Storage	131.9 MT	13	NA	11		57	496	NA	NA
Supply Depots	10550 SQFT	26	37.66	17	19.0	51	601	13.80	2.0
Power Plants	176 KW	20	94.3	7	46.6	28	260	40.7	
Maritime Ports	7.8 ST/DY	6	95	6	28	17	219	13.0	2.63
RR Yards	33.7 ST/DY	4	78	2	19	18	139	9.3	
Explosive Plant	1 MT	1	100	1	100	3	28	71.	
Airfields	23			4		12	359		
Naval Bases	15			3		17	215		
Bridges	883			48		217	2505		
Commo Install	45			2		2	15		
Radar Sites	50			5		65	413		
SAM Sites	130			47		62	338		
Locks & Dams	91			2		2	10		
Ferries	34			11		7	44		

Total Sorties: 9,351

		<u>f/</u> Results	
<u>Armed Recce Sorties</u>		<u>Destroyed</u>	<u>Damaged</u>
74,975	Vessels	3358	5590
	Vehicles	2261	2131
	RR Stock	1484	1767

- a/ Assessments are based on best information received, will be refined as more accurate information becomes available.
- b/ Strike plus flak suppression sorties. Some applied to multiple targets; in this summary assigned to principal target.
- c/ National capacity in 1,000's where measurement shown except POL. Dispersed storage capacity is not included.
- d/ Percentages of national capacity where appropriate.
- e/ Also numerous attacks during armed recce and other missions.
- f/ Also numerous installations, AA sites, bridges, etc, attacked and road and rail cuts made.
- g/ Per cent inactive due to dismantling or abandonment of facilities as a result of air strikes.
- (\*) These columns are not additive, since the number of installations, both targeted and struck in some cases, apply to more than one category of targets. (i.e., barracks, supply and ammo depots).

NOTE: For comparative purposes.

US world-wide ammo storage capacity is 6,936,000 metric tons (CONUS 5,719,000 MT).  
 US world-wide military POL storage capacity is 15,452,000 MT; national US commercial capacity is 151,325,000 MT; approximate average \$ value of 1 MT of POL products is \$28.  
 US world-wide military supply depot covered storage space is 137,100,000 sq. ft. (CONUS 121,300,000 sq. ft.).

Total kilowatt capacity of power plants serving metropolitan areas: New York - 7.6 million; Chicago - 6 million; Washington (DC and Md/suburbs only) - 2.4 million.

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## DCSOPS

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1 Cy

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1 Cy

## ACSI-CI

1 Cy

## ACSI-Eastern

1 Cy

## STAG

1 Cy

## NAVY:

## CHIEF OF NAVAL OPERATIONS

2 Cys

## DNI

1 Cy

## OP-921E

1 Cy

## OP-922Y1

1 Cy

## OP-922Y2

1 Cy

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1 Cy

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CINCLANT	1 Cy
CINCSTRIKE	1 Cy
CINCSAC	1 Cy
SAC 544	1 Cy
CINCTAC	1 Cy
AFSTRIKE	1 Cy
CONTIC	1 Cy
CINCALCOM	1 Cy
CINCEUR	1 Cy
CINCUSAREUR	1 Cy
CINCUSAFE	1 Cy
CINCNAVEUR	1 Cy
CINCCONAD	1 Cy
CIA	

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DIA:

DIADR	1 Cy
DIADD	1 Cy
DIAAP	1 Cy
SC-1	1 Cy
XX	1 Cy
AP-2	1 Cy
AP-2A3	2 Cys
AP-2F	4 Cys
AP-1	1 Cy
AP-1C3	1 Cy
AP-1H2	1 Cy
CO-2C	1 Cy
JT	1 Cy
CI	1 Cy

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AP-1R2  
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AP-1T  
JS

1 Cy  
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